U.S. Department of Energy
Office of River Protection
P.O. Box 450
Richland, Washington 99352

03-OSR-0008

Mr. R. F. Naventi, Project Manager
Bechtel National, Inc.
2435 Stevens Center
Richland, Washington 99352

Dear Mr. Naventi:

CONTRACT NO. DE-AC27-01RV14136 – RESPONSE TO FINDINGS OF SAFETY REQUIREMENTS DOCUMENT DESIGN STANDARDS IMPLEMENTATION INSPECTION REPORT, IR-02-012

References:

1. BNI letter from R. F. Naventi to R. J. Schepens, ORP, "Bechtel National, Inc. Response to Inspection Report IR-02-012 - Findings IR-02-012-01-FIN and IR-02-012-04-FIN – Safety Requirements Document Design Standards Implementation Inspection Report," CCN 035836, dated December 13, 2002.

2. BNI letter from R. F. Naventi to R. J. Schepens, ORP, "Bechtel National, Inc. Response to Inspection Report IR-02-012, Finding IR-02-012-03-FIN – Safety Requirements Document Design Standards Implementation Inspection Report," CCN 047329, dated December 13, 2002.

3. ORP letter from R. J. Schepens to R. F. Naventi, BNI, "Safety Requirements Document (SRD) Design Standards Implementation Inspection Report," IR-02-012," 02-OSR-0507, dated November 15, 2002.

This letter rejects part of the Bechtel National, Inc. (BNI) Reference 1 responses and all of the Reference 2 response that addressed Safety Requirements Document (SRD) Design Standards Implementation Inspection Report Findings documented in Reference 3. Specifically, the responses to Findings IR-02-012-01 (a and b) and IR-02-012-03 are rejected. The U.S. Department of Energy, Office of River Protection (ORP) concluded the responses to IR-02-012-01-FIN (a and b) and IR-02-012-03-FIN were incomplete, as discussed in the Enclosure. The response to IR-02-012-04-FIN that addressed failure to follow procedures is acceptable. Also, it was noted that your response to IR-02-012-01-FIN was inconsistent with the commitment made to the ORP in the Pretreatment (PT) Preliminary Safety Analysis Report (PSAR) (PT-PSAR-339) to utilize the standards as identified in the SRD.

You are requested to submit, within 15 days of receipt of this letter, a supplemental response addressing the deficiencies discussed in the Enclosure and the steps that will be taken to improve the performance of implementing the SRD-specified Implementing Codes and Standards.

If you have any questions, please contact me, or your staff may call P. P. Carier, WTP Safety Regulation Division, (509) 376-3574.

Sincerely,

Roy J. Schepens
Manager

OSR:JLP

Enclosure

Office of River Protection (ORP)
Summary of Bechtel National, Inc.'s (BNI) Response Deficiencies
for the Safety Requirements Document (SRD) Design Standards Implementation
Inspection Report, IR-02-012

The deficiencies identified with BNI's response to Inspection Report IR-02-012 are as follows:

1. In response to IR-02-012-01a-FIN and IR-02-012-01b-FIN regarding use of American Society of Mechanical Engineers (ASME) Section III for analysis acceptance criteria methodology for piping, piping supports, vessels and vessel supports subjected to earthquake loading, BNI indicated that pertinent sections of the ASME Section III were selected for part of the design.

   - The Finding response asserted BNI had acted in accordance with the River Protection Project Waste Treatment and Immobilization Plant (WTP) Contract. Furthermore, BNI's response stated it "is not required to list supplemental code or rules selected in conformance with the SRD identified codes." These statements are incorrect. The WTP Contract No DE-AC27-01RV14136, Section C (Statement of Work), Standard 7, (d) requirements clearly specify, "The Contractor shall conduct work in accordance with the Contractor developed and DOE approved Safety Requirement Document (SRD)." The SRD does not list ASME Section III as an Implementing Code and Standard. Application of codes and standards not currently available in the SRD requires BNI to submit an Authorization Basis Change Notice (ABCN) or Authorization Basis Amendment Request (ABAR) for DOE review and approval prior to their use.

   - The response indicated no design rules are provided in ASME Section VIII and ASME B31.3 to establish earthquake loads and perform seismic analysis. The ORP inspectors found this statement incorrect because for piping and piping supports ASME B31.3 Chapter II, subsection 301.5.3 provides the design rules for earthquake loading by stating: "Piping shall be designed for earthquake-induced horizontal forces. The method of analysis may be as described in ASCE 7 or the Uniform Building Code." Similarly for vessels and vessel supports, the ASME Section VIII, Division 1, subsection UG-22 of the Code, states seismic loadings shall be considered and subsection UG-23 specifies the allowable stresses for earthquake loading. Therefore, the SRD cited codes do address earthquake loading.

   - In the Finding response, BNI stated it "is not required to list supplemental codes and rules selected in conformance with SRD." This is not consistent with BNI's responses provided to the OSR Questions HLW-PSAR-163 and PT-PSAR-339. BNI's response to Q-163 stated: "The WTP project is aware that ASME Section III is not currently called out in the SRD. The project will take necessary action (before authorization of PT) to tailor the standard to add ASME Section III methodology seismic and fatigue analysis of vessels and supports or use alternative methodology already in the SRD." In the Finding response, BNI

committed to an ABCN or ABAR when ASME Section III methodology is used in the design of vessels and vessel supports.

The inspectors performed a review of 24690-WTP-3PS-MV00-T0002, *Seismic Qualification Criteria for Pressure Vessels*. Section 7.3 of this Engineering Specification identifies ASME Section III, Division 1, and Subsections NC, NF and Appendix F as required analysis basis and acceptance criteria for seismic analysis. The inspectors concluded the ASME Section III Appendix F allowable stress limits (i.e., an increase factor of 2.0) are clearly not in compliance with the allowable increase of 1.2 permitted for ASME Section VIII or, the allowable increase of 1.33 for ASME B31.3. Furthermore, the inspectors identified the allowable increase is not in compliance with margins of safety required by DOE-STD-1020. For Performance Category-1 (PC-1) and PC-2 Structures, Systems and Components (SSCs), DOE-STD-1020 states "UBC shall be followed" permitting a one-third increase in allowable stress for earthquake loading. For PC-3 SSCs, the standard provides an increase allowable that is less than that permitted by ASME Section III, Appendix F. The inspectors do not agree with "cherry picking" allowables from standards not in the SRD. SRD Safety Criterion provides implementing codes and standards including DOE-STD-1020, UBC, ASME Section VIII, ASME B31.3, ASCE-4, ASCE-7 and ANSI/AISC N690. These codes and standards provide methods of analysis and criteria sufficient to design piping, pipe supports, vessels, and vessel supports.

It is not clear how the corrective actions will resolve the inconsistency between the Finding responses and the PSAR responses. The Finding responses indicated an ABAR would be delivered to DOE by January 31, 2003. Yet the PSAR responses indicated the SRD Implementing Codes and Standards would be used and an ABAR would not be submitted. This inconsistency needs clarification. Given the PSAR response, it was unclear how BNI would assure design work already completed would be in accordance with the SRD identified Implementing Codes and Standards. It was unclear as to how the corrective actions would prevent recurrence of this condition.

2. In response to IR-02-012-03-FIN regarding the failure to meet Contractual requirements to implement the DOE-approved SRD in that there was no documented evidence the Contractor had established a process that incorporated Human Factors Engineering in the facility design, BNI failed to provide an acceptable response to the Finding. The following deficiencies are related to the response:

- The response did not commit to a systematic implementation of Contractual requirements to implement SRD SC 4.3-6 and perform job task analysis in accordance with SRD SC 4.3-6 implementing standard Institute of Electrical and Electronics Engineers, Inc., (IEEE) 1023-1988.

- The Contractor's response did not adequately describe the reason for the deficiency in that a comprehensive description of why the Contractor failed to implement SRD SC 4.3-6 and implement IEEE 1023-1988 job task analysis during WTP design was not provided.

- The Contractor's description of corrective steps taken and the results achieved, failed to adequately demonstrate that SRD SC 4.3-6 required implementation of IEEE 1023-1988 has been initiated by BNI.

- The corrective steps that will be taken to avoid further deficiencies was incomplete in that the Contractor had not initiated comprehensive job task analysis in accordance with IEEE 1023-1988 Section 6.1 Task Analysis.

- The response failed to address the Contractor's management of the design process that allowed the design to progress for over 2 years without implementing the Contractual requirements of SRD SC 4.3-6, and did not adequately address the BNI project management team's failure to implement Contractual requirements.

- The Contractor's response did not state when job task analysis would be initiated in accordance with IEEE 1023-1988 Section 6.1 Task Analysis and SRD SC 4.3-6 will be incorporated into the design.

Therefore, the ORP finds the BNI responses addressing SRD Design Standards Implementation Inspection Report Findings, IR-02-012-01a-FIN, IR-02-012-01b-FIN, and IR-02-012-03-FIN unacceptable.